

Installation Manual for Outdoor Unit

AV10NMVERA

AV16NMVERA

No.0150501418

- Please read this manual carefully before using
- Keep this operation manual for future reference

User Manual

MRVII adopts "simultaneous control" type, all indoors should be heating or cooling simultaneously.

To protect compressor, before startup, the unit should be electrified for over 12 hours. If the unit is not used for a long time, please cut off the power to save energy, or the unit will consume the power.

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Operation condition:

To use the air conditioner normally, please perform as to the below conditions.

Operating Range of Air Conditioner				
cooling dry	indoor	max.	DB: 32 ℃	WB: 23℃
		min.	DB: 18 ℃	WB: 14℃
	outdoor	max.	DB: 43 ℃	WB: 26℃
		min.	DB: -5℃	
heating	indoor	max.	DB: 27 ℃	
		min.	DB: 15 ℃	
	outdoor	max.	DB: 21 ℃	WB: 15℃
		min.	DB: -20℃	

Safety precaution

- If the air conditioner is transferred to the others, this manual should be transferred together.
- Before installation, please read "Safety precaution" carefully to confirm the correct installation.
- The mentioned precaution includes "ΔWARNING" and "ΔCAUTION". The precaution caused death or heavy injury for faulty installation will be listed in "ΔWARNING". Even the cautions listed in "ΔCAUTION" also may cause serious accident. So both of them are related to the safety, and should be executed severely.
- After installation, perform a trial and confirm everything normal, then introduce the operation manual to the user. Besides, put the manual to the user and ask them to preserve it carefully.

WARNING

- The installation or the maintenance should be performed by the authorized agency. Or the non-specialized operation will cause water leakage, electric shock or fire etc accidents.
- The installation should be executed as per the manual, or the faulty installation will cause water leakage, electric shock or fire etc accidents.
- Please install the unit at the space which can bear the weight. Or the unit will drop down to cause the human injury.
- The installation should defend against the typhoon, and the earthquake etc. Abnormal installation will cause the unit fall down.
- Use the correct cable and make reliable earthing. Fix the terminal firmly and the loose connection will cause heating or fire etc accident.
- The wiring should be in shape and can not be raised. Be earthed firmly and can not be clipped by the electric box cover or the other plate. The incorrect installation will cause heating or fire.
- When setting or transferring the unit, there should not be other air into the refrigerant system except for R410A. The gas mixture will cause the abnormal high pressure which will cause break or human injury etc accidents.
- When installation, please use the accessories with the unit or the special parts, or it will cause water leakage, electric shock, fire, refrigerant leakage etc accidents.
- Don't lead the water drainage pipe into the drainage groove with the poisonous gas, such as sulphur. Or the poisonous gas will enter indoor.
- In installation or after installation, please confirm if there is refrigerant leakage, please take measures for ventilation. The refrigerant will cause poisonous gas as meeting fire.
- Don't install the unit at the place where there may be flammable gas leakage. In case the gas leaks and gather around the unit, it will cause fire.
- The drainage pipe should be installed as per the manual to confirm the fluent drainage. Also take measures for heat insulation against dew drop. Incorrect water pipe installation will cause water leakage even and make the things wet.
- For the liquid pipe and the gas pipe, take measures for heat insulation too. If there is no heat insulation, the dew drop will wet the things.

Safety precaution

CAUTION

- Execute earthing for the unit. But the earthing wire can not be connected to the gas pipe, water pipe, lightening rod or the telephone earthing wire. Improper earthing will cause electric shock.
- Don't install the unit at the place where leaks the flammable gas. Or it will cause fire.
- Execute the water drainage pipe according to the manual, improper installation will cause water leakage to wet the family things.
- The outdoor fan can not face to the flower or the other vegetable, or the blowing gas will make the flower dried up.
- Please ensure the maintenance room, if not, it will cause the maintenance person damaged.
- When installing the unit on the roof or the other high place, to prevent the person falling down, please set the fixed ladder and the railing at the passage.
- Use the two-end spanner, and fasten the nut at proper torque. Don't fasten the nut excessively against the flared setion broken. Or it will cause refrigerant leakage and lack of oxygen.
- Take measures for heat insulation to the refrigerant pipe, or there will be water leakage or dew drop to wet the family things.
- After finishing the refrigerant pipe, make leakage test by charging the nitrogen. In case the refrigerant leaks in a small room and exceeds the limited concentration, it will cause lack of oxygen.
- Don't use the other refrigerant except for R410A. The R410A pressure is 1.6 times higher than R22 pressure. The refrigerant R410A tank is marked with pink sign.
- Against charging different refrigerant, we changed the stop valve diameter of the R410A unit. To enhance the compression consistence, we also changed the flared pipe dimension. Prepare the R410A specially tools according to the below table.

	R410a specially tool	Remarks
a	gauge manifold	range:HP>4.5MPa,LP>2MPa
b	charge hose	pressure:HP:5.3MPa,LP:3.5MPa
c	electronic balance for charging R410A	can not use the measurable charging tank
d	torque spanner	
e	flare tool	
f	copper pipe gauge for adjusting projecting margin	
g	vacuum pump adapter	must be with reverse stop valve
h	leakage detector	can not use freon leakage detector,but the He detector

- When charging refrigerant, the refrigerant must be taken out as liquid state from the tank.

Installation instruction

In installation, please check specially the below items:

- If the connected units quantity and the total capacity is in the allowable range?
- If the refrigerant pipe length is in the limited range?
- If the pipe size is proper? And if the pipe is installed horizontally?
- If the branch pipe is installed horizontally or vertically?
- If the additional refrigerant is counted correctly and weighed by the standard balance?
- If there is refrigerant leakage?
- If all the indoor power supplies can be on/off simultaneously?
- If the power voltage is in compliance with the data marked on the rating label?
- If the address of indoors and outdoors has been set?

(1) Before installation

1) Before installation, check if the model, power supply, pipe, wires and parts purchased respectively are correct.

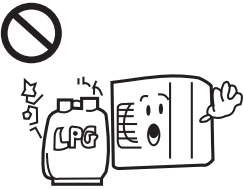
2) Check if the indoors and outdoors can be combined as the following.

outdoor		indoor		gather pipe
capacity (100W)	combination type	indoor Qty	total indoor capacity	
280	single	1-16	140-364	
450	single	1-26	225-585	
560	combination(280+280)	2-33	280-728	HZG-20/A
730	combination(450+280)	3-43	367-956	HZG-20/A
900	combination(450+450)	4-48	450-1170	HZG-20/A
1010	combination(450+280+280)	4-48	505-1313	HZG-30/A
1180	combination(450+450+280)	5-48	590-1534	HZG-30/A
1350	combination(450+450+450)	5-48	680-1768	HZG-30/A

Installation instruction

indoor capacity (x10 ³ Btu/h)	total indoor capacity(100W)	branch pipe (optional)
07	less than 101	FQG-B120
09		
12		
16		
18	more than 180, less than 370	FQG-B180
24		
28		
30		
34	more than 370, less than 700	FQG-B370
38		
	more than 700	FQG-B700

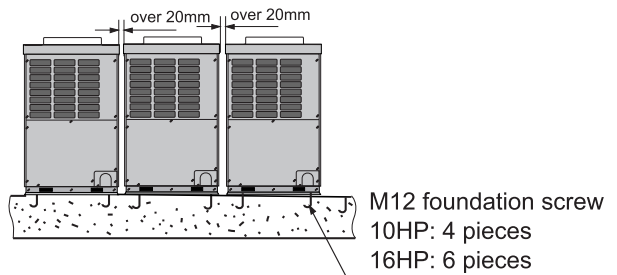
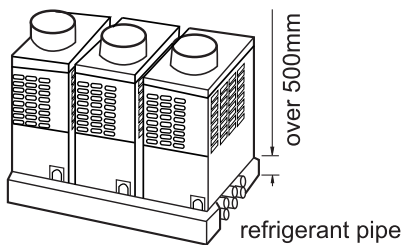
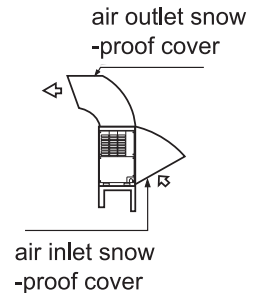
(2) Installation place selection

Air-conditioner can't be installed in the place with inflammable gas. Or it will cause fire hazard. 	The unit should be installed at the place with good ventilation. No obstacle at the air inlet/outlet. And no strong wind blows the unit. 	The unit should be installed at the strong enough place. Or it will cause vibration and noise. 
The unit should be installed at the place where the cold/hot air or noise will not interfere the neighbours. 	The installation space refers to the latter info. • The place where the water can flow fluently. • The place where no other heat source will affect the unit. • Pay attention to the snow against clogging the outdoor. • In installation, install the anti-vibration rubber between the unit and the bracket.	

Installation instruction

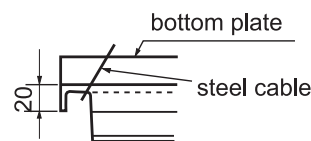
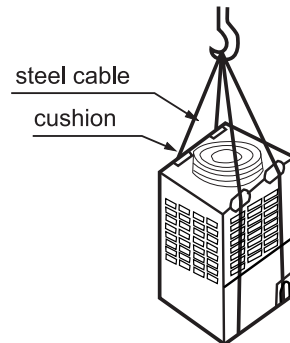
Note:

1. Install adapter to change wind direction at the gas short circuit place.
2. When installing multiple units, there should be enough air inlet place against air in short circuit.
3. In snowy area, install the unit under the bracket or the snow-proof cover against the accumulative snow on the unit.
4. Do not install the unit at the place where the flammable gas will leak.
5. Install the unit at the strong enough place.
6. Install the unit at the flat place.
7. When the refrigerant pipe is leaded out from the bottom of the unit, the below section should be a bracket with over 500mm height, see below figure.
8. When being installed at the place with strong wind, set the air outlet of the unit and the wind direction vertical. Also fix the unit with the screw.
9. When opening the electric box cover for maintenance, please fix the cover with screw firmly.



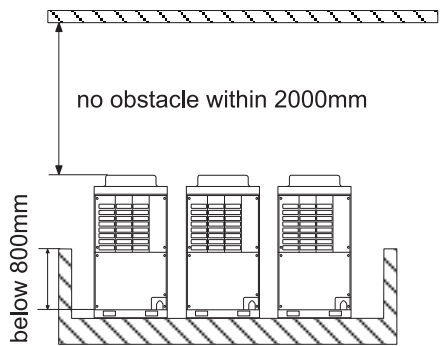
(3) Transportation

- In transportation, please don't dismantle the packaging, and move the unit to the installation location as closely as possible.
- If the packaging must be dismantled, hang up the unit with rope against damage.
- Don't hang the unit only at two points. When hanging the unit, don't sit on the unit. The unit should be upright.
- When removing the unit with the forklift, put the fork into the special hole at bottom of the unit.
- When being hanged, the rope should be 4 pieces of steel cable with over 6mm diameter.
- Put the cushion at the contact section between steel cable and the unit against the distortion or damage.

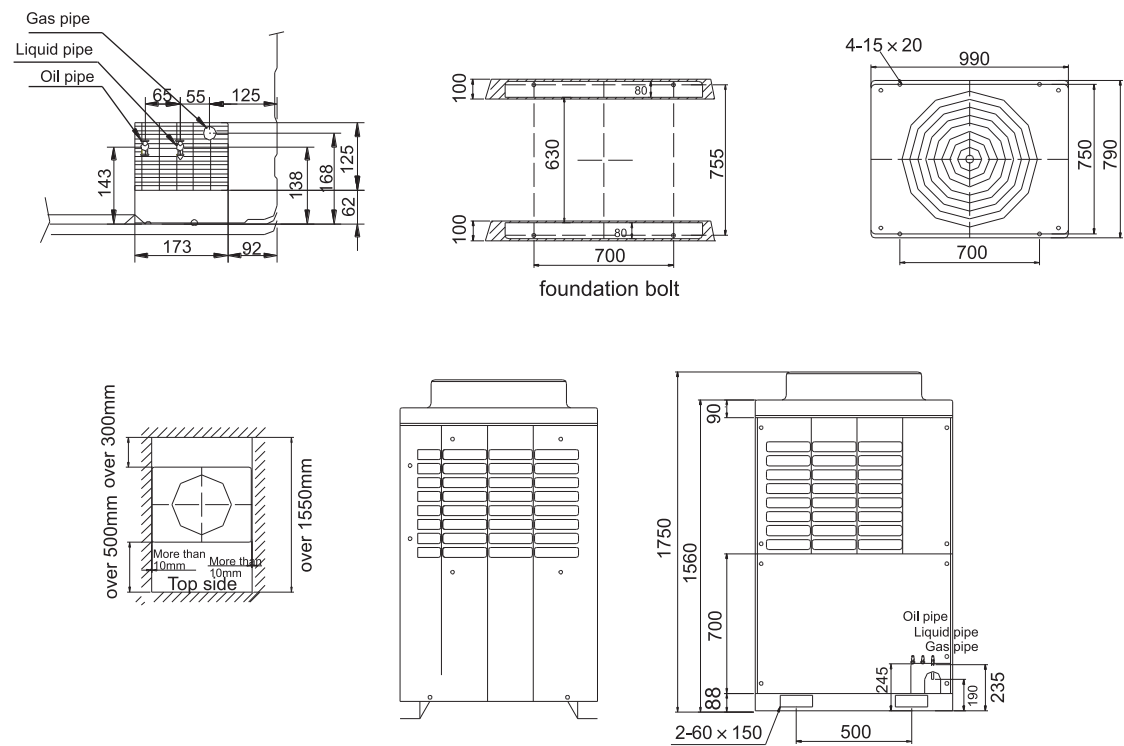


Exterior and installation dimensions

Note:
There should be no obstacles in 2000mm above the top of outdoor unit;
Obstacles around outdoor should be less than 800mm to the bottom of unit.
Master unit should be the nearest one to the first gather pipe.

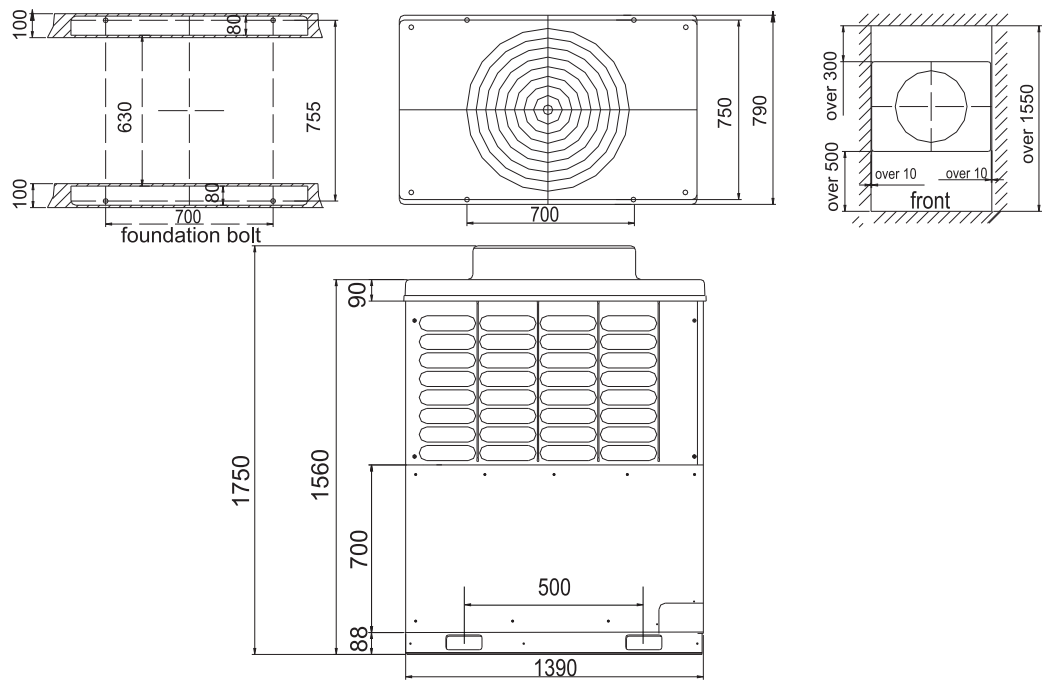


1.10HP exterior and installation dimensions

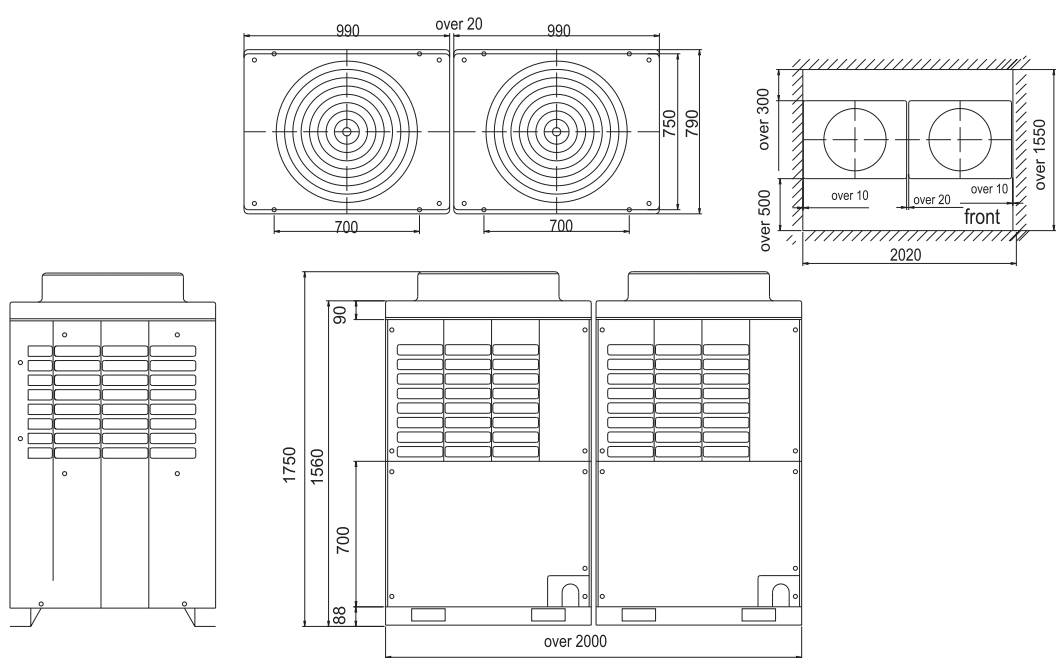


Exterior and installation dimensions

2.16HP exterior and installation dimensions

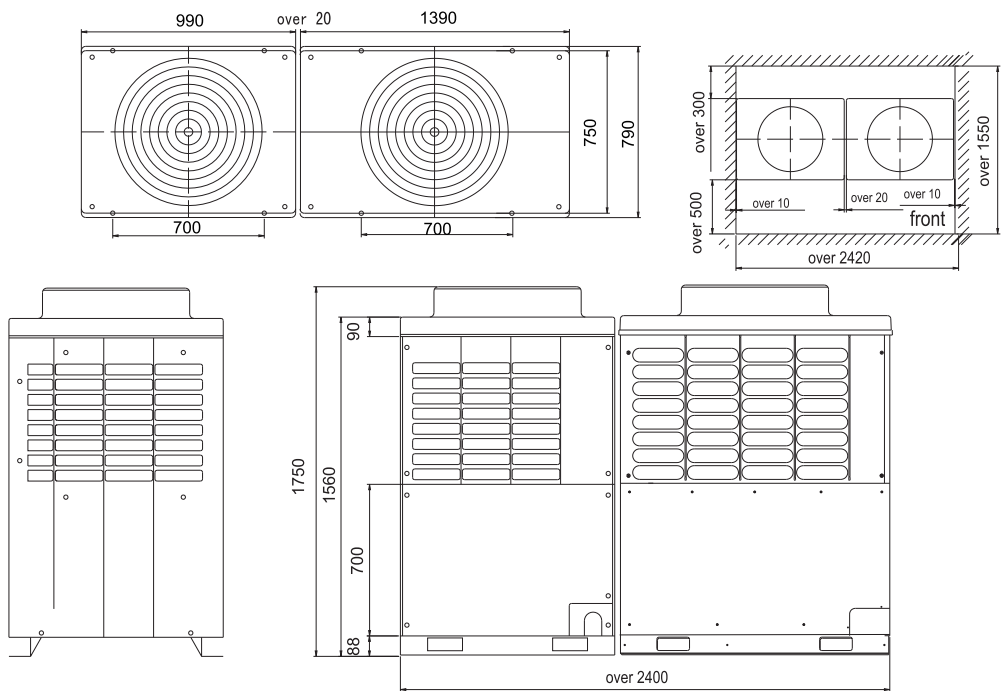


3.20HP exterior and installation dimensions

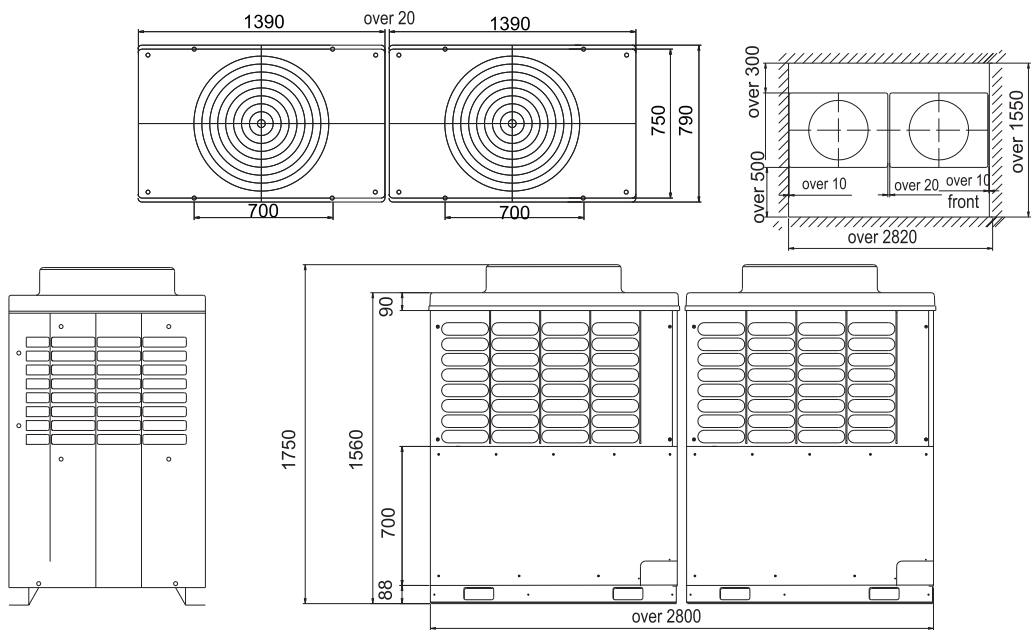


Exterior and installation dimensions

4.26HP exterior and installation dimensions

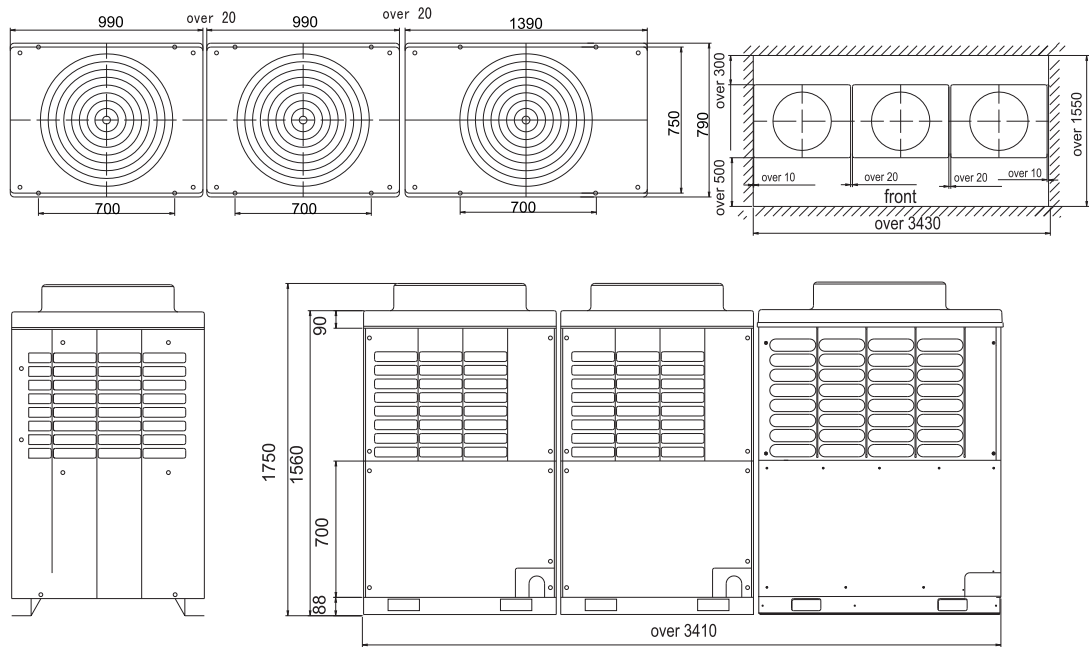


5.32HP exterior and installation dimensions

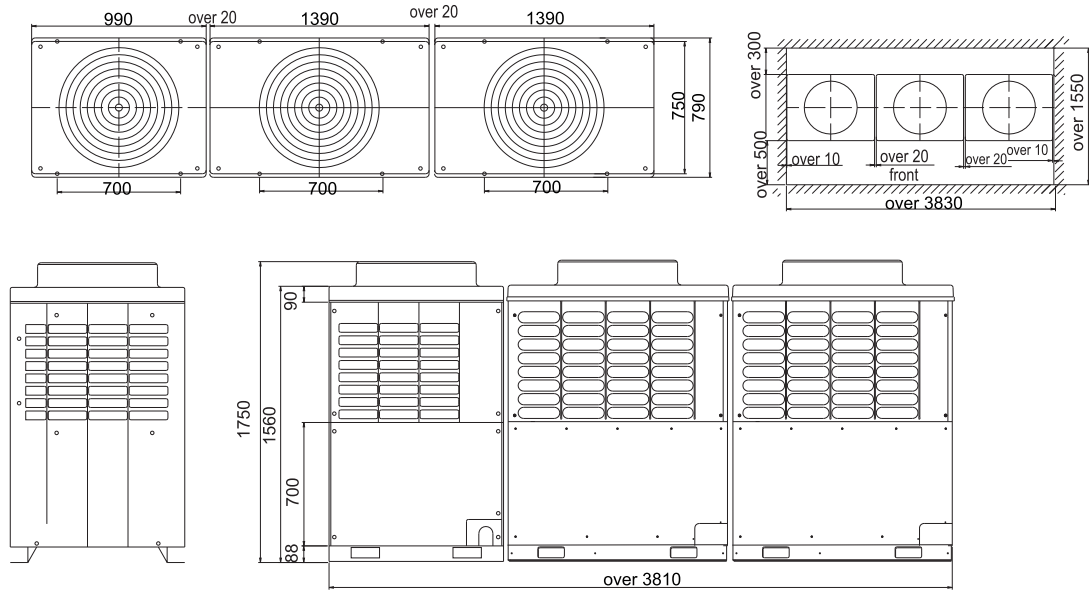


Exterior and installation dimensions

6.36HP exterior and installation dimensions

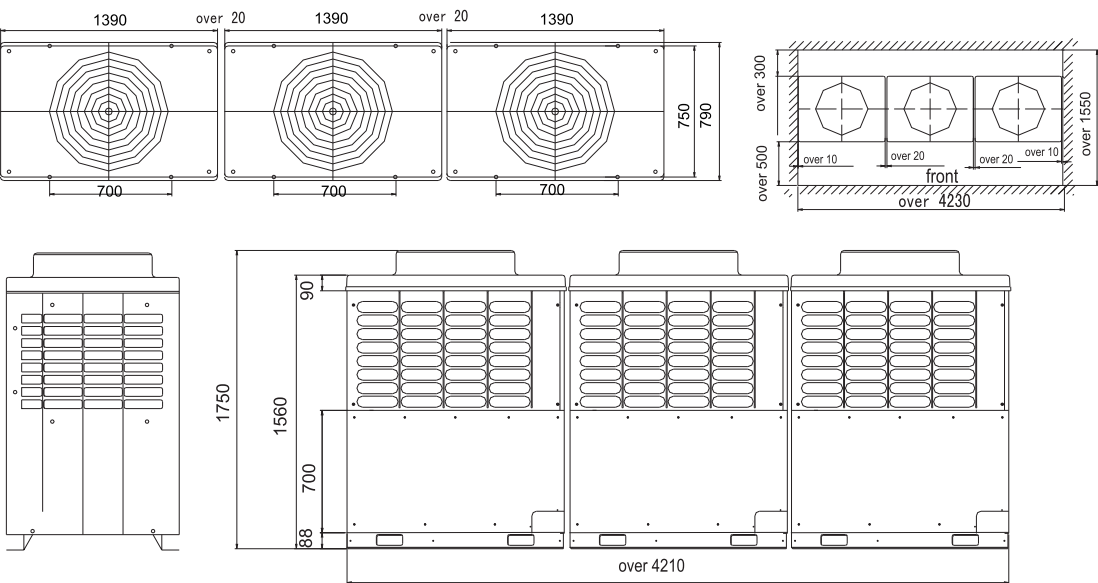


7.42HP exterior and installation dimensions



Exterior and installation dimensions

8.48HP exterior and installation dimensions



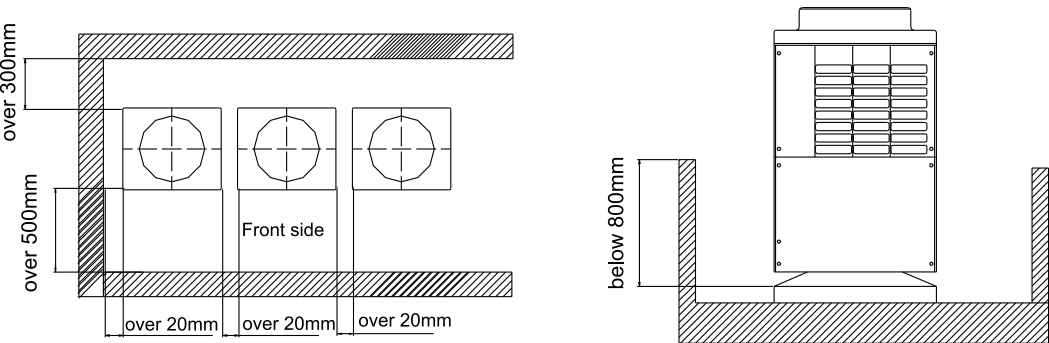
Note:

The distance between two outdoor units in the same line and the distance from unit to the wall can be increased for easy maintenance and better heart exchange if there is enough space.No special request on outdoor location sequence and its position.

9. Combination installation dimensions

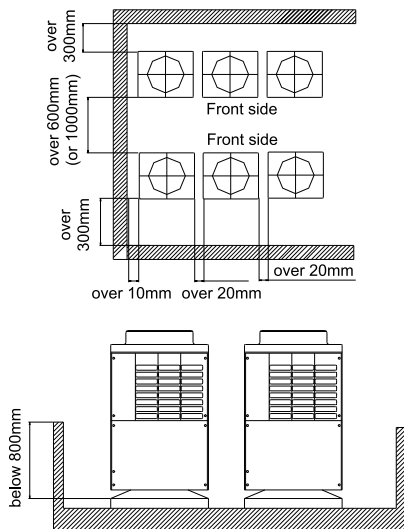
(1) When outer wall is lower than the outdoor condenser

A. Sites for one-row layout

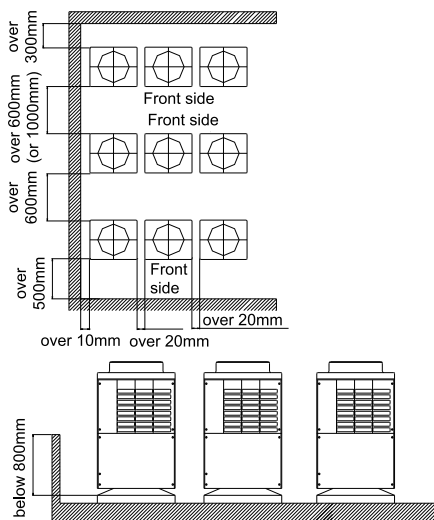


Exterior and installation dimensions

B. Sites for two-row layout



C. Sites for three-row layout

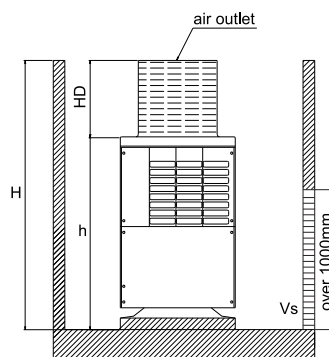
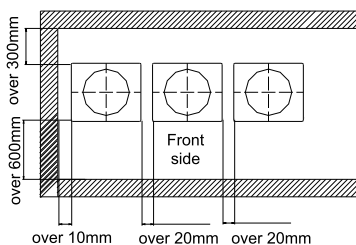


10. Wall higher than the outdoor condenser

A. Place with air inlet hole

Notes:

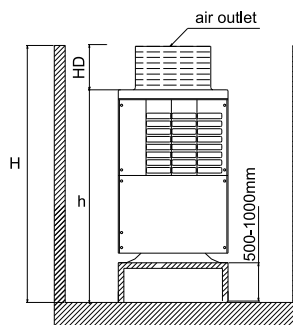
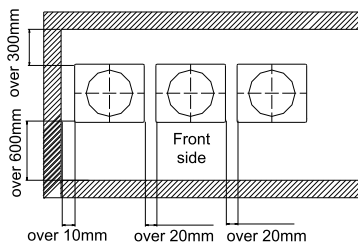
- Fan speed V_s at air inlet is 1.5m/s or below.
- Air outlet height $HD=H-h$ and below 1m.



B. Place without air inlet hole

Notes:

- Set a 500~1000mm bracket.
- Air outlet height $HD=H-h$ and below 1m.



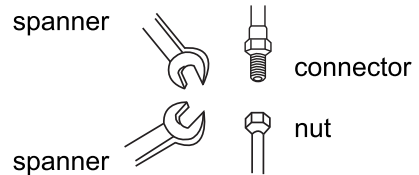
Installation procedure

A. Refrigerant pipe connection

Pipe connection method:

- To ensure the efficiency, the pipe should be as short as possible.
- Daub the refrigerant oil on the connector and the flare nut.
- When bending the pipe, the bending semi-diameter should be as large as possible against the pipe being broken or bent.
- When connecting the pipe, aim at the center to thread the nut by hand and tighten it with the double spanners.
- Don't let the impurity such as sand, water etc into the pipe.

When fastening and loosening the nut, operate with double spanners, because only one spanner cannot execute firmly.



If threading the nut as not aiming at the center, the screw thread will be damaged, further it will cause leakage.

Cautions in piping installation:

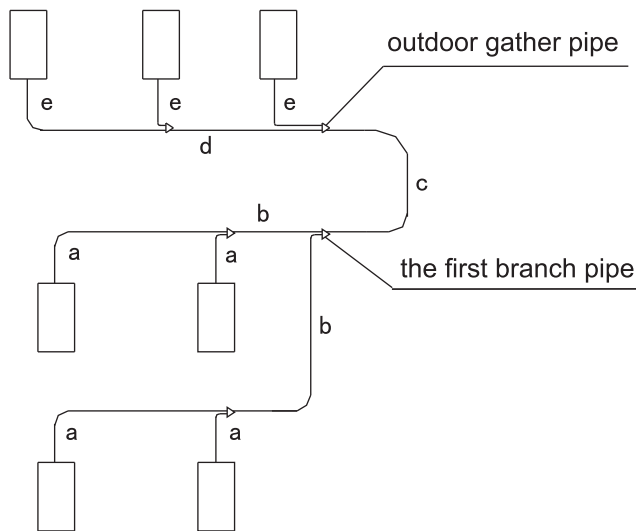
1. When welding the connector with hard solder, charge nitrogen into the pipe against oxidation. Or the oxygen film in the pipe will clog the capillary and the expansion valve, even cause the deathly accident.
2. The refrigerant pipe should be clean. If the water and the other impurity enter the pipe, charge the nitrogen to clean the pipe. The nitrogen should flow under the pressure of about 0.5Mpa and when charging the nitrogen, stop up the end of the pipe by hand to enhance the pressure in the pipe, then loose the hand (meanwhile stop up the other end).
3. The piping installation should be executed after the stop valves are closed.
4. Before welding the valve and the pipes, use the wet cloth to cool down the valve and the pipes.
5. When the connection pipe and the branch pipe need to be cut down, please use the special shears and cannot use the saw.

Pipe material and specs selection

1. Please select the refrigerant pipe of the below material.
Material: the phosphoric oxidize seamless copper pipe, model: C1220T-1/2H (diameter is over 19.05); C1220T-0(diameter is below 15.88).
2. Thickness and specs:
Confirm the pipe thickness and specs according to the pipe selection method(the unit is with R410a, if the pipe over 19.05 is 0-type, the pressure preservation will be bad, thus it must be 1/2H type and over the min. thickness.
3. The branch pipe and the gather pipe must be from Haier.
4. When installing the stop valve, refer to the relative operation instruction.
5. The pipe installation should be in the allowable range.
6. The installation of branch pipe and gather pipe should be performed according to the relative manual.

Installation procedure

Pipe specification:



1. Pipe “a” diameter (between indoor and branch pipe) (depends on indoor pipe)

Indoor (x10 ³ Btu/h)	Gas pipe	Liquid pipe
07~09	Ø9.52	Ø6.35
12~18	Ø12.7	Ø6.35
24~48	Ø15.88	Ø9.52

2. Pipe “b” diameter (between branch pipes)

Total indoor capacity after the branch pipe (KW)/(× 10 ³ Btu/h)	Gas pipe	Liquid pipe
~22.4/76.4	Ø15.88	Ø9.52
22.4~33.0/76.4~112.6	Ø22.22	
33.0~47.0/112.6~160.4	Ø28.6	Ø12.7
47.0~71.0/160.4~242.3		Ø15.88
71.0~110.0/242.3~375.4	Ø31.8	Ø19.05
110.0~/375.4~	Ø38.1	

Installation procedure

3. Pipe “c” diameter (main pipe, between outdoor gather pipe and the first branch pipe)

Outdoor capacity	Main pipe		Enlarged main pipe	
	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
28.0KW	Ø22.2	Ø9.52	Ø25.4	Ø12.7
45.0KW	Ø28.6	Ø12.7	Ø31.8	Ø12.7
56.0KW	Ø28.6	Ø15.88	Ø31.8	Ø15.88
73.0KW	Ø31.8	Ø19.05	Ø38.1	Ø19.05
90.0KW	Ø31.8	Ø19.05	Ø38.1	Ø19.05
101.0KW	Ø38.1	Ø19.05	Ø38.1	Ø19.05
118.0KW	Ø38.1	Ø19.05	Ø38.1	Ø22.2
135.0KW	Ø38.1	Ø19.05	Ø38.1	Ø22.2

Note:

When the distance from outdoor to the longest indoor is over 90m, the main pipe should be the enlarged diameter.

4. Pipe “d” diameter (between gather pipes)

Total outdoor capacity before the gather pipe (KW)/(×10 ³ Btu/h)	Liquid pipe(a,c)	Gas pipe(b,d)
~62.0/211.6	Ø15.88	Ø28.58
62.0~96.0/211.6~327.5	Ø15.88	Ø31.8
96~101.0/327.5~344.7		Ø38.1
101.0~/344.7~	Ø19.05	

5. Pipe “e” diameter (between outdoor and the gather pipe)

Outdoor capacity	Gas pipe	Liquid pipe	Oil equalization pipe
10HP	Ø22.2	Ø9.52	Ø9.52
16HP	Ø28.58	Ø12.7	

Installation procedure

Copper pipe selection:

hardness	softness				Half-hardness							
Outer diameter	Ø6.35	Ø9.52	Ø12.7	Ø15.88	Ø19.05	Ø22.2	Ø25.4	Ø28.58	Ø31.8	Ø34.9	Ø38.1	Ø41.3
Min. thickness	0.8	0.8	1.0	1.0	1.0	1.1	1.2	1.4	1.4	1.4	1.4	1.43

Note: If the copper pipe with outer diameter 19.05 is coil pipe, the thickness should be over 1.1.

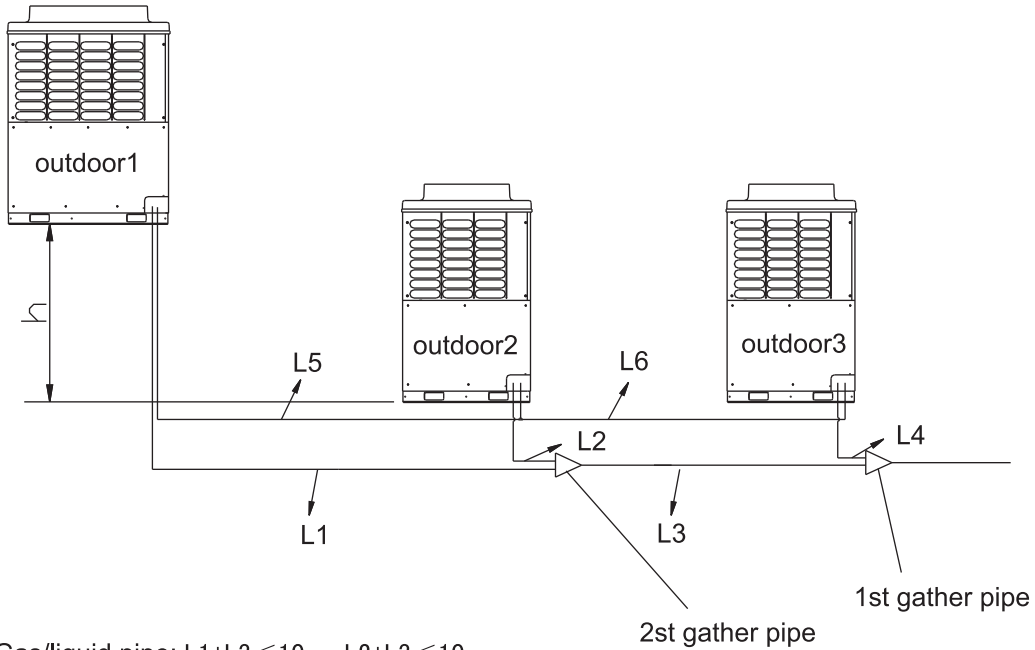
Long pipe and high drop

1. Allowable pipe length and height difference

Item \ Model		All outdoors
Single way total pipe length		300m
Single way max. pipe length		Max.: 150m; equivalent length: 175m
Main pipe between outdoor to 1st branch		Max. 70m
Pipe length between outdoors		Less than 10m to 1st branch pipe
Height difference between indoor and outdoor	Outdoor is upper	Max. 50m
	Outdoor is lower	Max. 40m
Height difference between outdoors (in the same system)		Within 5m (better be horizontal)
Max. pipe length from 1st branch pipe to indoor		Max. 40m
Height difference between indoors		Max. 15m

Installation procedure

2. Pipe length between outdoors



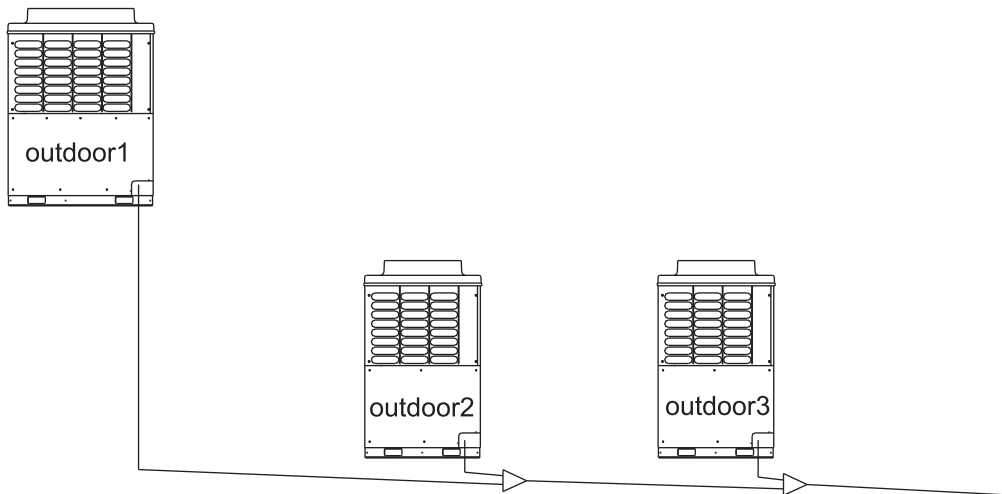
Gas/liquid pipe: $L1+L3 < 10\text{m}$, $L2+L3 < 10\text{m}$

Oil equalization pipe: $L5+L6 < 10\text{m}$

height difference between outdoors: $h < 5\text{m}$

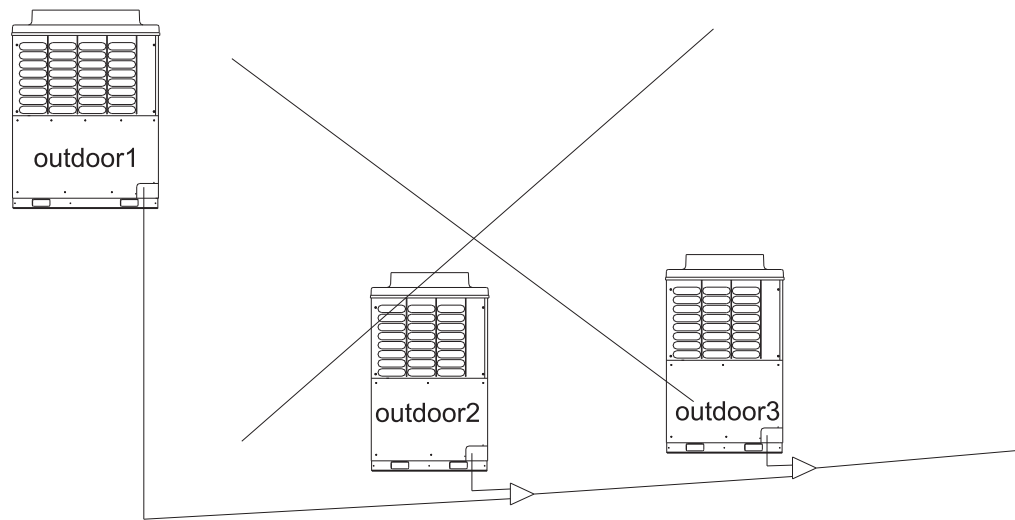
Note:

- a. HZG-30/A includes HZG-20/A;
- b. The connection pipe among outdoors can not be higher than the stop valve position;
- c. The connection pipe among outdoors should be horizontal or be in a certain angle as the below figure (less than 15degree).

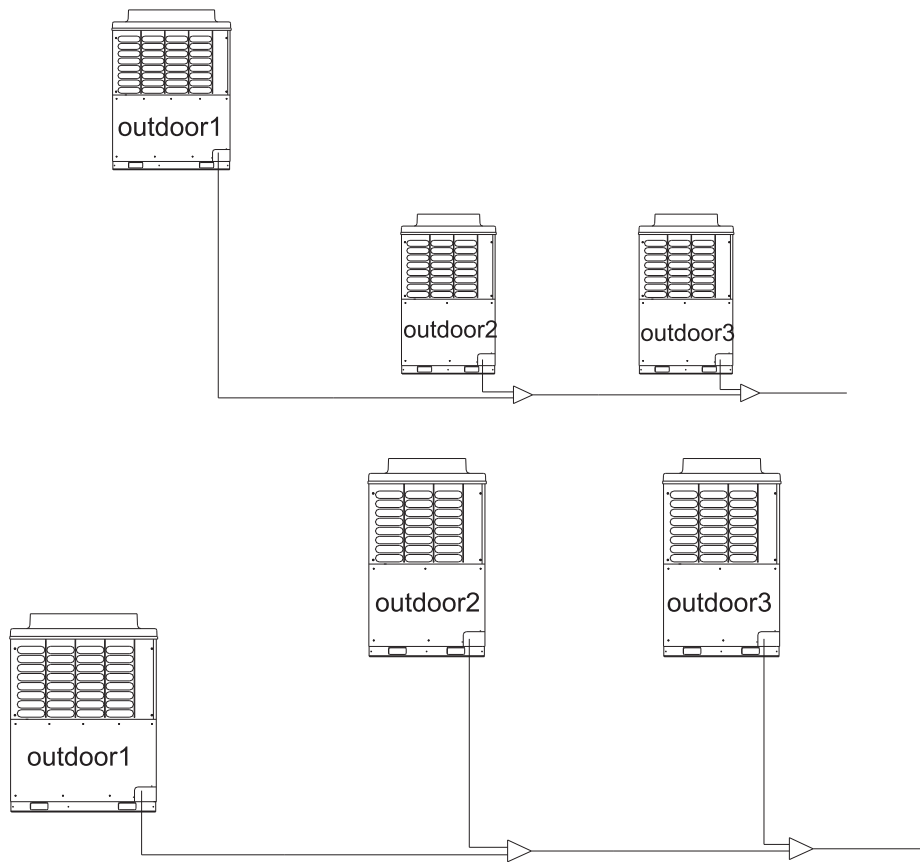


Installation procedure

Forbidden to be below angle.

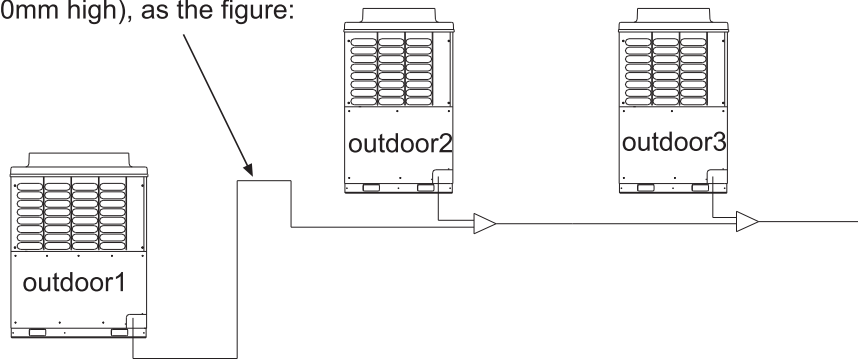


d. Installation at high difference:

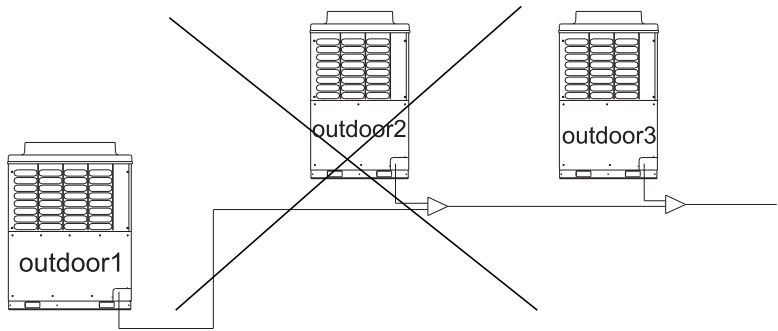


Installation procedure

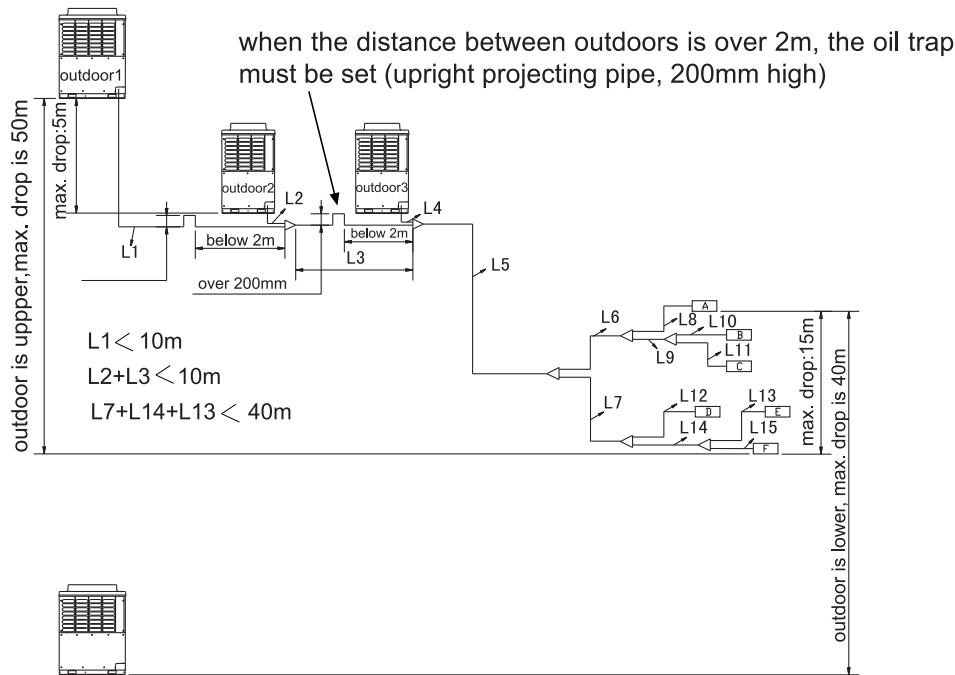
Oil trap (upright projecting pipe, 200mm high), as the figure:



Below is forbidden (compressor oil will flow into the lowest outdoor).



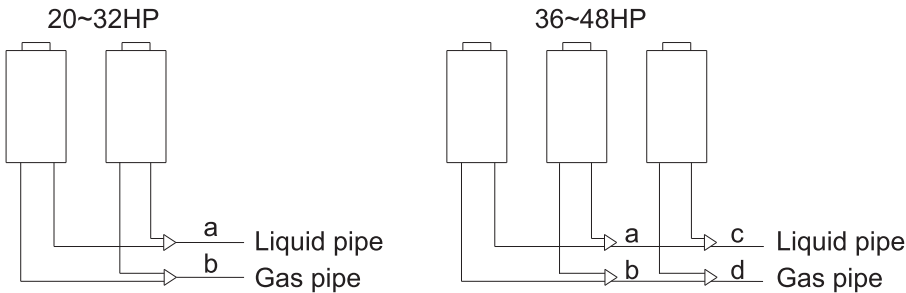
3. Allowable pipe length and height difference



Installation procedure

	Max. length	Pipe in above figure
Single way total pipe length	300	L1+L2+ L3+ L4+ L5+ L6+ L7+L8+ L9+ L10+ L11+ L12+ L13+ L14+ L15
Single way max. pipe length	Actual length: 150	L1+ L3+ L5+ L7+ L14+ L13
	Equivalent length: 175	
Max. pipe length after 1st branch pipe	40	L7+L13+L14
Main pipe actual length	70	L5
Height difference between indoors	15	—
Height difference between outdoors	5	—

Outdoor pipe dimension

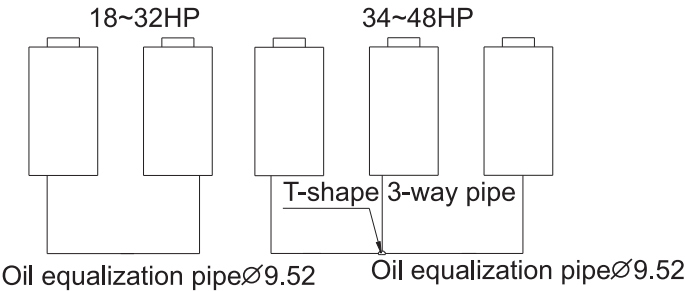


The pipe “a, b, c, d” should be confirmed as to the below table.

Former outdoor capacity (KW)/(× 10 ³ Btu/h)	Liquid pipe(a,c)	Gas pipe(b,d)
~62.0/211.6	Ø12.7	Ø28.58
62.0~96.0/211.6~327.5	Ø15.88	Ø31.8
96~101.0/327.5~344.7		Ø38.1
101.0~344.7~	Ø19.05	

Note: When the single pipe length is over 90m, the above pipe should be enlarged as the former information.

Oil equalization pipe connection



Installation procedure

Unit pipe spec and connection method (unit: mm)

A. Outdoor unit

Model	Gas pipe side		Liquid pipe side		Oil pipe side	
	Diameter	Connecting method	Diameter	Connecting method	Diameter	Connecting method
AV10NMVERA	Ø22.22	Brazing	Ø9.52	Flared joint	Ø9.52	Flared joint
AV16NMVERA	Ø28.58	Brazing	Ø12.7	Flared joint	Ø9.52	Flared joint

B. Indoor unit

Model Capacity	Gas pipe side		Liquid pipe side	
	Diameter	Connecting method	Diameter	Connecting method
07	Ø9.52	Flared joint	Ø6.35	Flared joint
09	Ø9.52		Ø6.35	
12	Ø12.7		Ø6.35	
16	Ø12.7		Ø6.35	
18	Ø12.7		Ø6.35	
24	Ø15.88		Ø9.52	
28	Ø15.88		Ø9.52	
30	Ø15.88		Ø9.52	
38	Ø15.88		Ø9.52	
48	Ø15.88		Ø9.52	

C. Pipe spec and the torque

diameter	Thickness(mm)	Torque(N.m)
Ø6.35	0.8	16~20
Ø9.52	0.8	40~50
Ø12.7	1.0	
Ø15.88	1.0	90~120
Ø19.05	1.0	100~140
Ø22.22	1.1	---
Ø25.4	1.2	---
Not less than Ø28.58	More than 1.4	---

Note: If the copper pipe with outer diameter 19.05 is coil pipe, the thickness should be over 1.1.

Installation procedure

Branch pipe

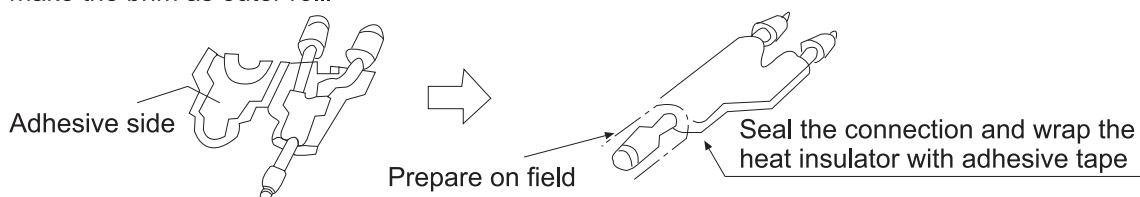
Outdoor unit type

Note:

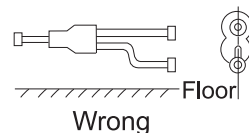
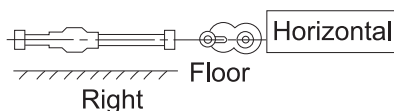
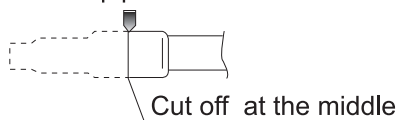
1. When connecting the gather pipe and the outdoor, please pay attention to the outdoor pipe dimension.
2. When adjusting the diameter among gather pipes and among the units, please must execute at the branch pipe side.
3. Please install the gather pipe(gas/liquid side) in horizontal or vertical direction.
4. When welding with hard solder, please must blow nitrogen. If not, a number of oxide will be produced and cause heavy damage.Besides,to prevent water and dust into the pipe, please make the brim as outer roll.

Branch pipe selection:

indoor total capacity(100W)	model
less than 101	FQG-B120
more than 101,less than 370	FQG-B180
more than 370,less than 700	FQG-B370
more than 700	FQG-B700

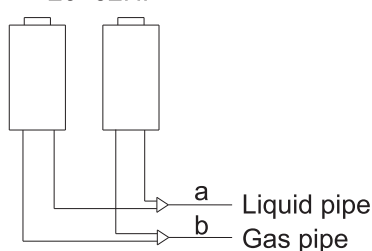


Cut off pipe with the cutter

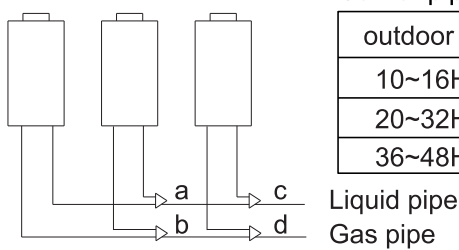


Gather pipe

20~32HP



36~48HP



Gather pipe selection

outdoor HP	gather pipe model
10~16HP	none
20~32HP	HZG-20/A
36~48HP	HZG-30/A

The pipe "a, b, c, d" should be confirmed as to the below table.

Former outdoor capacity (KW)/(×10 ³ Btu/h)	Liquid pipe(a,c)	Gas pipe(b,d)
~62.0/211.6	∅12.7	∅28.58
62.0~96.0/211.6~327.5	∅15.88	∅31.8
96~101.0/327.5~344.7		∅38.1
101.0~344.7~	∅19.05	

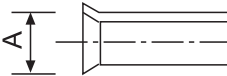
Note: When the single pipe length is over 90m, the above pipe should be enlarged as the former information.

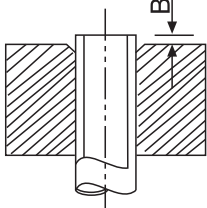
Installation procedure

Piping installation

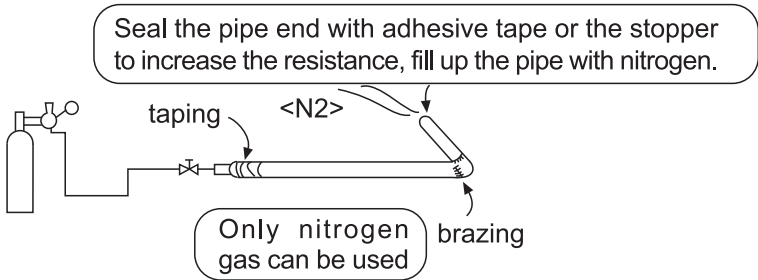
Important

- Please don't let the pipe and the parts in the unit collide each other.
- When connecting the pipes, close the valves fully.
- Protect the pipe end against the water, impurity into the pipes (welding after being flat, or being sealed with adhesive tape).
- Bend the pipe as large semi-diameter as possible(over 4 times of the pipe diameter).
- The connection between outdoor liquid pipe and the distributing pipe is flared type. Please expand the pipe with the special tool for R410A after installing the expanding nut. But if the projecting pipe length has been adjusted with the copper pipe gauge, you can use the original tool to expand the pipe.
- Since the unit is with R410A, the expanding oil is ester oil, not the mineral oil.
- When connecting the expanding pipe, fasten the pipes with double-spanner. The torque refers to the former info.

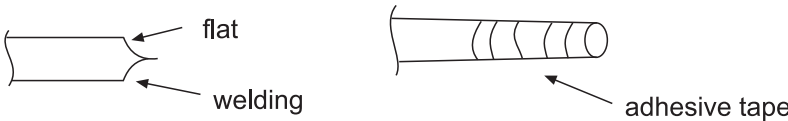
Expanding pipe:A(mm)		Projecting length of pipe to be expanded:B(mm)		
	pipe outer diameter	A	when it is hard pipe	
		0 -0.4	special tool for R410A	the former tool
	Ø6.35	9.1	0-0.5	1.0-1.5
	Ø9.52	13.2		
	Ø12.7	16.6		
	Ø15.88	19.7		



- The outdoor gas pipe and the refrigerant distributing pipe, as well the refrigerant distributing pipe and the branch pipe should be welded with hard solder.
- Weld the pipe at the same time charge the nitrogen. Or it will cause a number of impurity (a film of oxidation) to clog the capillary and the expansion valve, further cause the deadly failure.

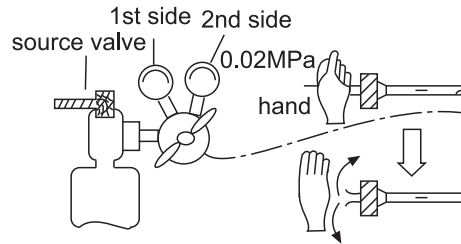


- Protect the pipe end against the water, impurity into the pipes (welding after being flat, or being sealed with adhesive tape).



Installation procedure

- The refrigerant pipe should be clean. The nitrogen should flow under the pressure of about 0.02MPa and when charging the nitrogen, stop up the end of the pipe by hand to enhance the pressure in the pipe, then loose the hand (meanwhile stop up the other end).



- When connecting the pipes, close the valves fully.
- When welding the valve and the pipes, use the wet cloth to cool down the valve and the pipes.

B. Leakage test

1. The outdoor unit has been executed the leakage test in the factory. After connecting the distributing pipe, execute the leakage test from the outdoor check valve and the indoor. Besides, while testing, the valves should be close.

2. Refer to the below figure to charge the nitrogen into the unit to take a test. Never use the chlorin, oxygen, flammable gas in the leakage test. Apply pressure both on the gas pipe and the liquid pipe.

3. Apply the pressure step by step to the target pressure.

a. Apply the pressure to 0.5MPa for more than 5 minutes, confirm if pressure goes down.

b. Apply the pressure to 1.5MPa for more than 5 minutes, confirm if pressure goes down.

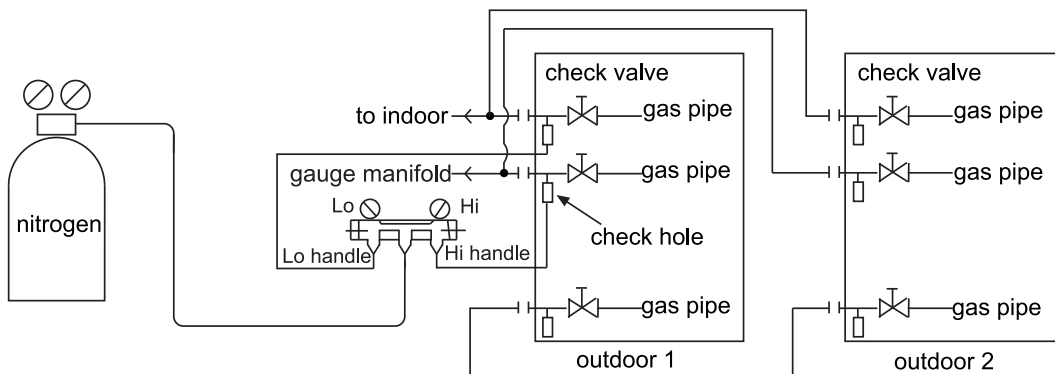
c. Apply the pressure to the target pressure (4.0MPa), record the temp. and the pressure.

d. Leave it at 4.0MPa for over 1 day, if pressure does not go down, the test is passed.

Meanwhile, when the temp. changes for 1degree, pressure will change 0.01MPa as well. Correct the pressure.

e. After confirmation of a~d, if pressure goes down, there is leakage. Check the brazing position, flared position by laying on the soap. modify the leakage point and take another leakage test.

4. After leakage test, must execute the evacuation.

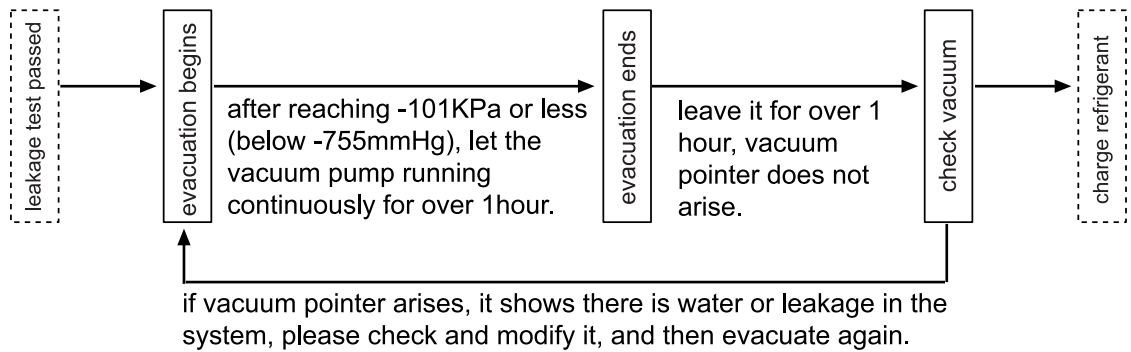


Installation procedure

C. Evacuation

Evacuate at the check valve of liquid stop valve and both sides of the gas stop valve. The oil equalization pipe also must be vacuum (executed at the oil equalization pipe check valve respectively).

Operation procedure:



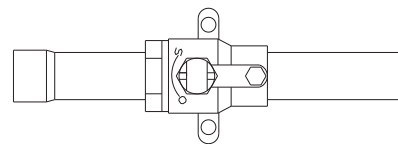
Because the unit is with refrigerant R410A, the below issues should be paid attention:

- To prevent the different oil into the pipe, please use the special tool for R410A, especially for gauge manifold and charging hose.
- To prevent the compressor oil into the refrigerant cycle, please use the anti-counter-flow adapter.

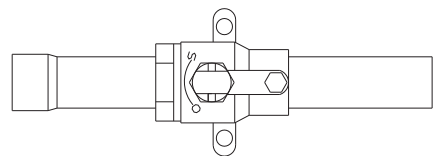
D. Check valve operation

Open/close method:

- Take down the valve cap, gas pipe turns to "open" state as right figure.
- Turn the liquid pipe and the oil equalization pipe with hexangular spanner until it stops. If opening the valve strongly, the valve will be damaged.
- Tighten the valve cap.



"open"state



"close"state

Tighten torque as the table below:

Tighten torque N.m			
	shaft (valve body)	cap (cover)	T-shape nut (check joint)
for gas pipe	less than 7	less than 30	13
for liquid pipe	7.85 (MAX15.7)	29.4 (MAX39.2)	8.8 (MAX14.7)
for oil equa- lization pipe	4.9 (MAX11.8)	16.2 (MAX24.5)	8.8 (MAX14.7)

Installation procedure

E. Additional refrigerant charging

Charge the additional refrigerant as liquid state with the gauge.

If the additional refrigerant can not be charged totally when the outdoor stops, charge it at the trial mode.

If the unit runs for a long period in the state of lack of refrigerant, compressor will occur failure. (the charging must be finished within 30 minutes especially when the unit is running, meanwhile charging the refrigerant).

A. Charging amount when out of factory excludes the refrigerant in the pipe.

B. The unit only is charged the standard volume of refrigerant (distributing pipe length is 0m).

Additional charging amount=actual length of liquid pipe*additional amount per meter liquid pipe

Additional charging amount= $L1 \times 0.35 + L2 \times 0.25 + L3 \times 0.17 + L4 \times 0.11 + L5 \times 0.054 + L6 \times 0.022$

L1: total length of 22.22 liquid pipe L2: total length of 19.05 liquid pipe

L3: total length of 15.88 liquid pipe L4: total length of 12.7 liquid pipe

L5: total length of 9.52 liquid pipe L6: total length of 6.35 liquid pipe

C. Refrigerant charging and additional charging

Model	additional refrigerant charging per meter(kg/m)						charge when out of factory
	Ø22.22	Ø19.05	Ø15.88	Ø12.7	Ø9.52	Ø6.35	
AV10NMVERA	0.35	0.25	0.17	0.11	0.054	0.022	10kg
AV16NMVERA							16kg

Refrigerant charging amount when out of factory excludes that in the distributing pipe.

Note:

- To prevent the different oil into the pipe, please use the special tool for R410A, especially for gauge manifold and charging hose.
- Mark the refrigerant type in different colour on the tank. R410A is pink.
- Must not use the charging cylinder, because the R410A will change when transferring to the cylinder.
- When charging refrigerant, the refrigerant should be taken out from the tank as liquid state.
- Mark the counted refrigerant volume due to the distributing pipe length on the label.

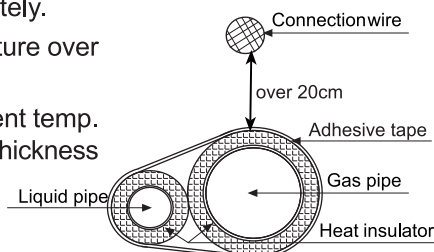
Fix the refrigerant pipe

- In operation, the pipe will vibrate and expand or shrink. If not being fixed, the refrigerant will focus on one part to cause the broken pipe.
- To prevent the central stress, fix the pipe for every 2-3m.

Heat insulation

- Gas pipe and liquid pipe should be heat insulated separately.
- The material for gas pipe should endure the high temperature over 120°C. That for liquid pipe should be over 70°C.
- The material thickness should be over 10mm, when ambient temp. is 30°C, and the relative humidity is over 80%, the material thickness should be over 15mm.

- The material should cling the pipe closely without gap, then be wrapped with adhesive tape. The connection wire can not be put together with the heat insulation material and should be far at least 20cm.



Trial operation and the performance

3-minute delay function

- If starting up the unit after being powered off, the compressor will run about 3 minutes later against being damaged.

Cooling/heating operation

- Indoor units can be controlled individually, but cannot run in cool and heat mode at the same time. If the cool mode and the heat mode are existing simultaneously, the unit set latter will be standby, and the unit set earlier will run normally. If the A/C manager sets the unit at cooling or heating mode fixedly, the unit can not run at the other modes.

Heating mode characteristic

- In operation if outdoor temp. arises, indoor fan motor will turn to low speed or stop.

Defrosting in heating mode

- In heating mode, outdoor defrosting will affect the heating efficiency. The unit will defrost for about 2~10 minutes automatically, at this time, the condensate will flow from outdoor, also in defrosting, the vapour will appear at outdoor, which is normal. Indoor motor will run at low speed or stop, and outdoor motor will stop.

The unit operation condition

- To use the unit properly, please operate the unit under the allowed condition range. If operating beyond the range, the protection device will act.
- The relative humidity should be lower than 80%. If the unit runs at the humidity over 80% for a long period, the dew on the unit will drop down and the vapour will be blown from air outlet.

Protection device (such as high pressure switch)

High pressure switch is the device which can stop the unit automatically when the unit runs abnormally.

When the high pressure switch acts, the cooling/heating mode will stop but the running LED on wired controller will be light still. The wired controller will display failure code.

When the following cases occur, the protection device will act:

In cooling mode, air outlet and air inlet of outdoor are clogged.

In heating mode, indoor filter is stucked with duct; indoor air outlet is clogged.

When protection device acts, please cut off the power source and re-start up after eliminating the trouble.

Trial operation and the performance

When power is failure

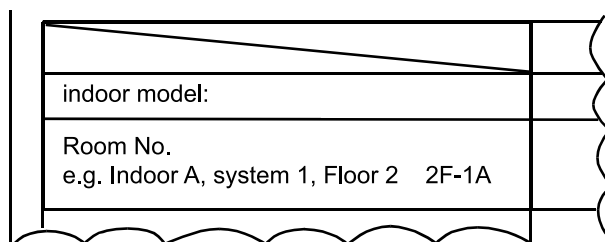
- When power is failure in running, all the operations will stop.
- After being electrified again, if with re-start up function, the unit can resume to the state before power off automatically; if without re-start up function, the unit needs to be switched on again.
- When abnormal occurs in running because of the thunder, the lightning, the interference of car or radio, etc, please cut off the power source, after eliminating the failure, press "ON/OFF" button to start up the unit.

Heating capacity

- The heating mode adopts the heat pump type that absorbs outdoor heat energy and releases into indoor. So if outdoor temperature goes down, the heating capacity will decrease.

System marks

- On the condition that multi MRV II systems are installed, in order to confirm the relationship between outdoor and indoor, please make marks on outdoor electric control box cover to indicate the connected indoor unit. As the below figure:

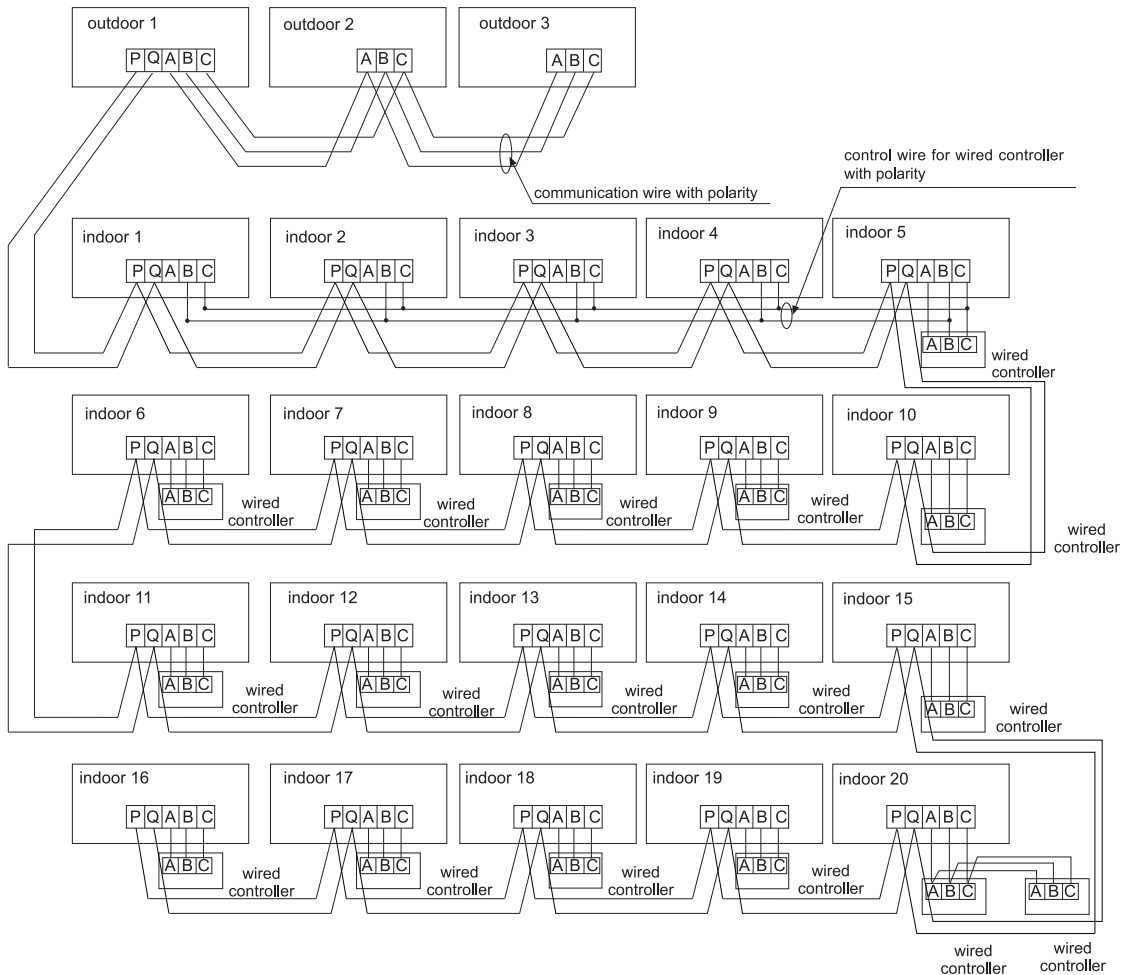


Trial operation

- Before trial operation:
Before being electrified, measure the resistor between power terminal block (live wire and neutral wire) and the earthed point with a multimeter, and check if it is over $1M\ \Omega$. If not, the unit can not operate. To protect compressor, electrify the outdoor unit for at least 12 hours before the unit runs. If the crankcase heater is not electrified for 6 hours, the compressor will not work. Confirm the compressor bottom getting hot.
Except for the condition that there is only one master unit connected (no slave unit), under the other conditions, open fully the outdoor operating valves (gas side, liquid side, oil equalization pipe). If operating the unit without opening the valves, compressor failure will occur. Confirm all indoor units being electrified. If not, water leakage will occur. Measure the system pressure with pressure gauge, at the same time, operate the unit.
- Trial operation
In trial operation, refer to the information of performance section. When the unit can not start up at the room temperature, make trial operation for outdoor.

Electric wiring and the application

Communication wiring figure



Outdoor units are in parallel through 3 polar wires. The outdoor and all indoor units are in parallel through 2 non-polar wires.

Three wiring methods between wired controller and indoor unit:

A. 1 to multi (group control): one wired controller controls 2~16 indoors, as shown in above figure, indoor 1~indoor 5: indoor 5 is wired control master unit, the others are wired control slave units. Wired controller and the master indoor (directly connected to wired controller) is connected by 3 polar wires; the other indoors and the master indoors are connected by 2 polar wires.

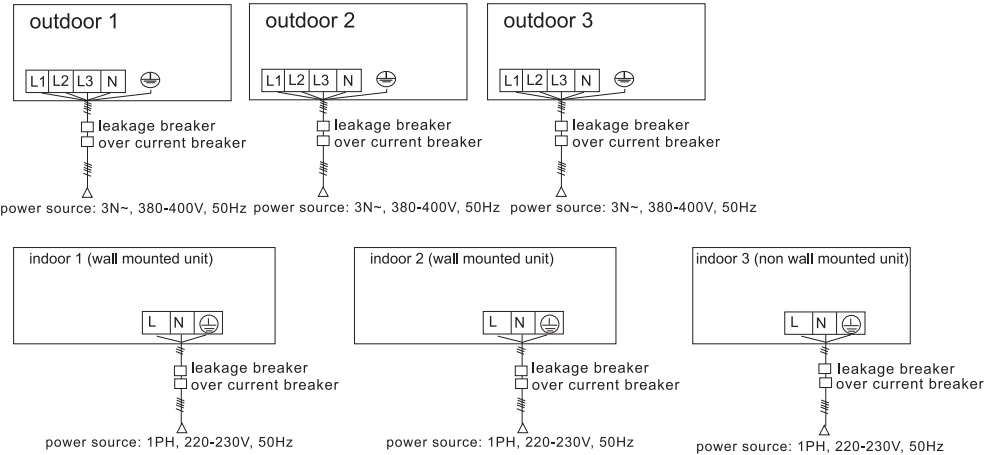
B. 1 to 1 (one wired controller controls one indoor): as shown in above figure, indoor 6~ indoor 19, indoor and wired controller are connected by 3 polar wires.

C. 2 to 1 (two wired controller controls one indoor): as shown in above figure, indoor 20. Either of wired controllers can be set as master wired controller, and the other is slave wired controller. Master/slave wired controller, and master/indoor are connected by 3 polar wires.

When indoor is controlled by remote controller, refer to the "wired control master unit/wired control slave unit/remote control unit table". A, B, C on signal terminal block need not wires and not connect the wired controller.

Electric wiring and the application

Power wiring figure



Indoor and outdoor use their individual power source. All indoors use one power source. Must install the leakage breaker and the over current breaker, or electric shock will occur.

Specs for power cable and communication wire

1. Outdoor power source and power cable

model \ item		power source	power cable section (mm ²)	wire length (m)	circuit breaker (A)	rated current of residual current circuit breaker(A) leakage current (mA) response time(s)	earthing wire	
							section(mm ²)	screw
individual power	AV10NMVERA	3N~, 380V, 50Hz	10	60	40	40A, 30mA, below 0.1s	3.5	M5
	AV16NMVERA		18	60	70	40A, 30mA, below 0.1s		

- a. Power cable must be fixed firmly.
- b. Each outdoor must be earthed well.
- c. When power cable exceeds the range, thicken it appropriately.

2. Indoor power source, communication wire between indoor and outdoor, among indoors

item \ indoor total current (A)	power cable section (mm ²)	wire length (m)	rated current of overcurrent breaker(A)	rated current of residual current circuit breaker(A) leakage current (mA) response time(s)	communication wire section	
					outdoor/indoor (mm ²)	indoor/indoor (mm ²)
< 10	2	23	20	20A, 30mA, below 0.1s	2-core × (0.75-2.0mm ²) shielded wire	
≥ 10 and < 15	3.5	24	30	30A, 30mA, below 0.1s		
≥ 15 and < 22	5.5	27	40	40A, 30mA, below 0.1s		
≥ 22 and < 27	10	42	50	50A, 30mA, below 0.1s		

- a. Power cable and communication wire must be fixed firmly.
- b. Each indoor must be earthed well.
- c. When power cable exceeds the range, thicken it appropriately.
- d. Shielded layer of communication wires must be connected together and be earthed at single point.
- e. Communication wire total length cannot exceed 1000m.

Electric wiring and the application

3. Communication wire for wired controller

wire length(m)	wire spec	wire length(m)	wire spec
<100	0.3mm ² × (3-core) shielded wire	≥300 and <400	1.25mm ² × (3-core) shielded wire
≥100 and <200	0.5mm ² × (3-core) shielded wire	≥400 and <600	2mm ² × (3-core) shielded wire
≥200 and <300	0.75mm ² × (3-core) shielded wire		

- Shielded layer of communication wire must be earthed at one end.
- The total length cannot exceed 600m.

4. Control type and the switchover

- Indoor unit can be controlled by wired controller or remote controller.
- When installation, the installer must set the unit due to the control type and wiring type.

Switchover between wired control master/slave unit /remote control unit, set when installation:

control type socket /dip switch	wired control master unit	wired control slave unit	remote control
CN23	short connected	disconnected	disconnected
CN30	short connected	short connected	disconnected
CN21	blank	blank	to remote receiver
SW08-[6]	ON	ON	OFF
signal terminal block	A,B,C to wired controller	B,C to wired controller	A,B,C not to wired controller

Note:

- In the above figure, the state in the frame is set when out of factory.
- The indoor controlled by master/slave wired controller and the indoor controlled by individual wired controller are all wired controlled master indoor.
- The remote receiver is equipped with a wire which can be inserted in CN21.

Electric wiring and the application

1. Indoor central control address setting method

No.	setting type	setting method	remarks
1	Set by hand	1.SW02 on indoor PCB is ON (upper); 2. The detailed position refers to the below table.	set on field
2	Set by wired controller	1. SW02 on indoor PCB is OFF(down), set when out of factory. 2. Press "FILTER" on wired controller continuously for 10 seconds into central control setting mode, and select the indoor central control address by "TEMP+/-". 3. Temp. area indicates: system address+XX, press "TEMP+/-", the unit number will change "00~3F" (00 is No.1, 3F is No.64), and the initialization is 00. 4. After selecting the number, press "SET" to save it; if pressing other buttons or no pressing within 15 seconds, it will quit automatically and keep the former setting.	set on field

Indoor central control address table (set by hand)

SW02								central control address	SW02								central control address	SW02								central control address
1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	
1	0	0	0	0	0	0	0	1	1	0	0	1	0	1	1	0	23	1	0	1	0	1	0	1	1	44
1	0	0	0	0	0	0	1	2	1	0	0	1	0	1	1	1	24	1	0	1	0	1	1	0	0	45
1	0	0	0	0	0	1	0	3	1	0	0	1	1	0	0	0	25	1	0	1	0	1	1	0	1	46
1	0	0	0	0	0	1	1	4	1	0	0	1	1	0	0	1	26	1	0	1	0	1	1	1	0	47
1	0	0	0	0	1	0	0	5	1	0	0	1	1	0	1	0	27	1	0	1	0	1	1	1	1	48
1	0	0	0	0	1	0	1	6	1	0	0	1	1	0	1	1	28	1	0	1	1	0	0	0	0	49
1	0	0	0	0	1	1	0	7	1	0	0	1	1	1	0	0	29	1	0	1	1	0	0	0	1	50
1	0	0	0	0	1	1	1	8	1	0	0	1	1	1	0	1	30	1	0	1	1	0	0	1	0	51
1	0	0	0	1	0	0	0	9	1	0	0	1	1	1	1	0	31	1	0	1	1	0	0	1	1	52
1	0	0	0	1	0	0	1	10	1	0	0	1	1	1	1	1	32	1	0	1	1	0	1	0	0	53
1	0	0	0	1	0	1	0	11	1	0	1	0	0	0	0	0	33	1	0	1	1	0	1	0	1	54
1	0	0	0	1	0	1	1	12	1	0	1	0	0	0	0	1	34	1	0	1	1	0	1	1	0	55
1	0	0	0	1	1	0	0	13	1	0	1	0	0	0	1	0	35	1	0	1	1	0	1	1	1	56
1	0	0	0	1	1	0	1	14	1	0	1	0	0	0	1	1	36	1	0	1	1	1	0	0	0	57
1	0	0	0	1	1	1	0	15	1	0	1	0	0	1	0	0	37	1	0	1	1	1	0	0	1	58
1	0	0	0	1	1	1	1	16	1	0	1	0	0	1	0	1	38	1	0	1	1	1	0	1	0	59
1	0	0	1	0	0	0	0	17	1	0	1	0	0	1	1	0	39	1	0	1	1	1	0	1	1	60
1	0	0	1	0	0	0	1	18	1	0	1	0	0	1	1	1	40	1	0	1	1	1	1	0	0	61
1	0	0	1	0	0	1	0	19	1	0	1	0	1	0	0	0	41	1	0	1	1	1	1	0	1	62
1	0	0	1	0	0	1	1	20	1	0	1	0	1	0	0	1	42	1	0	1	1	1	1	1	0	63
1	0	0	1	0	1	0	0	21	1	0	1	0	1	0	1	0	43	1	0	1	1	1	1	1	1	64
1	0	0	1	0	1	0	1	22																		

Communication address between indoor and outdoor setting by hand:

1st, 2nd bit of SW03 are ON, the latter six bits can confirm the communication address, the address setting refers to the "central control address setting table". For example, the communication address is 8, the dip switch of SW03 is 11000111.

Electric wiring and the application

2. Indoor control type selection

indoor PCB	wired control master unit	wired control slave unit	remote control	remarks
CN23	short connected	disconnected	disconnected	1.The communication address between master/slave wired controller and the outdoor is different. 2. If central control is necessary, all indoor central control addresses in one group are identical, while the indoor address in different groups is different too.
CN30	short connected	short connected	disconnected	
CN21	blank	blank	to remote receiver	
SW08-[6]	ON	ON	OFF	
SW01 [1]-[4]	"0"	1~15 (different dialing setting on SW01 for the slave units in one group)	"0"	
signal terminal block	A,B,C to wired controller	B,C to wired controller	A,B,C not to wired controller	

Note: In the above figure, the state in the frame is set when out of factory.

3.Setting state and the function defination of PCB and wired controller when out of factory

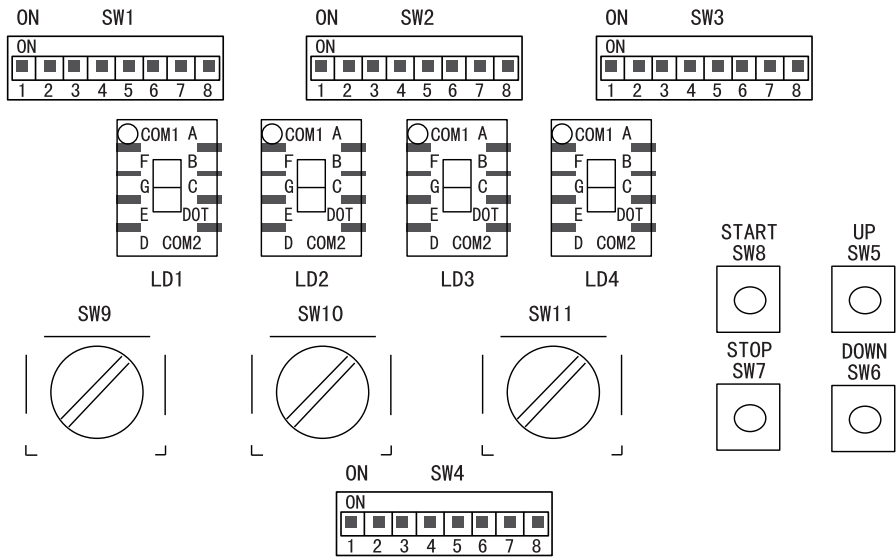
item	parts	state	function			
indoor PCB	dip switch	SW01 [1]-[4]	at "0"	1. When one wired controller controls one indoor, multiple wired controllers control one indoor, or indoor is controlled by remote controller, the switch needs not be changed. 2. When one wired controller controls multiple indoors, the switch of master unit is 0, while the slave units are at the position from 1 to 15.		
		SW02	all at "OFF"	1. When setting central controlled address by wired controller, it need not change. 2. When setting central controlled address by hand, refers to the setting table1.		
		SW03	all at "OFF"	When setting communication address between indoor and outdoor automatically, it needs not change. When setting by hand or by wired controller, refers to the setting table2.		
	jumper	CN23	connected	When being controlled by wired controller, it is connected; when being controlled by remote controller, it is disconnected.		
		CN25	disconnected			
		CN26	disconnected	output in series, connected to testing device.		
		CN27	disconnected	connected after being powered on, indoor EEV opens 2 minutes fully.		
		CN28	disconnected	connected after being powered on, indoor in time shorting function		
		CN29	disconnected	connected after being powered on, indoor EEV closes 2 minutes fully.		
		CN30	connected	When being controlled by wired controller, it is connected; when being controlled by remote controller, it is disconnected.		
		CN31	disconnected	indoor trial operation		
		dip switch	SW07-[5]	ON	Air inlet temp. TA compensation value	
	SW07-[5]				SW07-[4]	TA correction value
	SW07-[4]		ON	OFF	OFF	12℃
				OFF	ON	8℃
				ON	OFF	4℃
				ON	ON	0℃(out of factory)
	SW08-[1]		ON	ON: change high/mid/low fan speed; OFF: the fixed fan speed(for duct type).		
	SW08-[6]	ON	ON: be controlled by wired controller; OFF: be controlled by remote controller			

Electric wiring and the application

item	parts	state	function	
indoor PCB indicator	LED1	red	indicator of communication with wired controller. Shows indoor sending signal to wired controller	
	LED2	green	indicator of communication with wired controller. Shows indoor receiving signal from wired controller	
			LED1, LED2 used in combination. If communication between wired controller and indoor is normal, LED1, LED2 will flash regularly.If there is slave wired controller, FQY of LED1 of slave controller will be low.	
	LED3	red	indicator of communication with outdoor. Shows indoor sending signal to outdoor	
	LED4	green	indicator of communication with outdoor. Shows indoor receiving signal to outdoor	
			LED3, LED4 used in combination. If communication between indoor and outdoor is normal, LED1, LED2 will flash regularly.FQY of red LED is lower than that of green LED.	
	LED5	failure	in normal state, it is OFF. Confirm the failure due to the indicator flashes times	
	LED6	yellow	in normal state, it is OFF. Indicate when EEV is open/close fully.	
wired controller	dip switch	SW01-1	changeover between master and slave wired controller	ON set as slave wired controller OFF set as master wired controller
		SW01-2	changeover between celsius and fahrenheit	ON set as Fahrenheit OFF set as celsius
	resistor	J03	selection of room temp. display	0 no room temp. display 1 room temp. display
		J06	position selection of room temp. sensor	0 adopt the room temp.sensor in indoor 1 adopt the room temp.sensor in wired controller
		J07	auto restart selection	0 with auto restart function 1 without auto restart function
	diode	D1	time-shorting function	ON indoor time shorting OFF without time shorting
		D2	compulsory defrost	ON send compulsory defrost signal to indoor OFF normal state

Only when two wired controllers control one indoor, one of the wired controllers can be set as slave wired controller.

4. Dip switch introduction



Electric wiring and the application

4.1 Dip switch of outdoor connection board:

- 1) Dip switch of main control chip: SW1, SW2, SW3-8 bits of dip switch to be selected
- 2) Dip switch of communication chip: SW4-8 bits of dip switch to be selected
- 3) 16-bit rotary switch of communication chip: SW9, SW10, SW11, used to be selected.
- 4) Press switch of communication chip: SW7: START; SW8: STOP
- 5) Press switch of main control chip: SW9: UP; SW10: DOWN

4.2 Dip switch of communication chip: upper(low level): 1; lower(high level):0

SW4-1, 2, 3, 4 used for model selection:

SW4-1	piping length selection	SW4-1	SW4-2	description
		0	0	medium piping length, cooling suction pressure: 8kgf/cm ² , heating discharging pressure: 28kgf/cm ²
SW4-2		0	1	long piping length, cooling suction pressure: 7.5kgf/cm ² , heating discharging pressure: 30kgf/cm ²
		1	0	short piping length, cooling suction pressure: 8.5kgf/cm ² , heating discharging pressure: 26kgf/cm ²
		1	1	medium piping length
SW4-3	silent operation selection	0		allowable
		1		forbidden
SW4-4	over-match capacity setting	0		allowable
		1		forbidden

SW4-5, 6, 7, 8 used to set outdoor unit No. and outdoor unit No. lock

outdoor unit No.		SW4-6	SW4-7	SW4-8
	1	0	0	0
	2	0	0	1
	3	0	1	0
	4	0	1	1
	5	1	0	0
	6	1	0	1
	7	1	1	0
	8	1	1	1
SW4-5	searching outdoor after being electrified	0	begin to search outdoor	
		1	stop searching outdoor and lock the outdoor quantity	

The above functions are set in the communication chip 849.

Electric wiring and the application

SW1: 8-bit dip switch

		SW1-1	SW1-2	remarks
SW1-1 SW1-2	Defrosting condition "a" selection	0	0	8(E)
		0	1	10(E)
		1	0	6(E)
		1	1	6(E)
SW1-3	Pre-set			
SW1-4	Pre-set			
SW1-5	Forbidden to heat when outdoor temp. over 25degree	0		allowable
		1		forbidden
SW1-6	Pre-set			
SW1-B7	Low oil temp protection	0		allowable
		1		forbidden
SW1-B8	Pre-set			

SW2: 8-bit dip switch

outdoor capacity	SW2-1	SW2-2	SW2-3
16HP	1	0	0
16HP	0	0	1

SW2-4	Pre-set		
SW2-5	Pre-set		
SW2-6	Pre-set		
SW2-7	Pre-set		
SW2-8	with/without low pressure switch	0	with
		1	without

SW3: 8-bit dip switch, it is pre-set, so its function is not available.

Failure code

Failure code description (the failure is defined as 8-bit code, and 256 failure codes totally. Indoor failure code is confirmed by the failure code list and the unit No.):

- Outdoor failure is in EEPROM, which can save 5 failures of itself.
- Indoor failure is in EEPROM, which can save 5 failures of itself.
- The failure can be cleared from indoor or outdoor.

The 256 failure codes are distributed as follow:

Digital tube displays failure 0---19 (herein, 1,2,3,4 are used to display outdoor unit No.)

Digital tube displays failure 20---99 (No. 0 inverter outdoor failure)

Digital tube displays failure 120---199 (No. 1 inverter outdoor failure)

Digital tube displays failure 220---299 (No. 2 inverter outdoor failure)

Digital tube displays failure 720---799 (No. 7 inverter outdoor failure)

Communication chip failure:

1001-EEPROM read/write failure;

1002-indoor communication failure, no communication within 2 minutes continuously.

1003-main control chip 849 failure, no communication within 2 minutes continuously.

1004-slave unit communication failure, no communication within 2 minutes continuously.

1005-over match of indoor capacity

1006-reversing of 4-way valve

1007-4-way valve not ready

Principle of displaying the outdoor failure on wired controller:

When compressor running, indoor wired controller will display the outdoor failure due to the priority.

When compressor stops, it will display all indoor failures. Indoor failure includes: sensor failure, inverter board failure, fan motor driving board failure, protections.

(1) Inverter master outdoor failure code list

digit tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
20	20	defrosting temp. sensor Te failure	sensor temp. is below -60.87℃ (open circuit) or over 135.4℃ (short circuit) for 1 minute. Don't detecting in defrosting, allow to clear 2minutes and 40 seconds later after unit stops.
21	20	ambient temp. sensor Ta failure	sensor temp. is below -60.87℃ (open circuit) or over 135.4℃ (short circuit) for 1 minute
22	20	suction temp. sensor Ts failure	sensor temp. is below -60.87℃ (open circuit) or over 135.4℃ (short circuit) for 1 minute
23	20	discharging temp. sensor Td failure	after compressor runs for 5 minutes, sensor temp. is below -4.45℃ (open circuit) or over 337.14℃ (short circuit) for 1 minute
24	20	oil temp. sensor Toil failure	sensor temp. is below -60.87℃ (open circuit) or over 135.4℃ (short circuit) for 1 minute
25	20	heat exchanger inlet temp. too high Toci failure	sensor temp. is below -60.87℃ (open circuit) or over 135.4℃ (short circuit) for 1 minute
26	20	communication between indoor and outdoor failure	No.1 outdoor does not find indoor unit
27	20	master unit oil temp. too high	Toil $\geq$ 80℃ for 5 minutes, unit stops,outdoor alarms; 2 minutes and 40 seconds later after compressor stops, Toil is over 70℃ for 1 minute, resumable
28	20	high pressure sensor Pd failure	over 4.8V, or below 0.1V for 30 seconds

Failure code

digit tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
29	20	low pressure sensor Ps failure	over 4.8, or below 0.1V for 30 seconds
30	20	high pressure switch failure	switch opens for 1 minute, alarm;
31	20	low pressure switch failure	switch opens for 1 minute, alarm;
32	20	over cooling heat exchanger outlet temp. Tsc0 failure	sensor temp. is below -60.87℃ (open circuit) or over 135.4℃ (short circuit) for 1 minute
33	20	EEPROM of main chip 849 failure	EEPROM faulty, or being inserted conversely, with incorrect part
34	20	discharging temp. Td protection	Td over 120℃ for 10 seconds, unit stops and protection acts; 2 minutes and 50 seconds later, it can be cleared; when below 100℃, resumable
35	20	pre-set	
36	20	master unit oil temp. too low	Toil<PS+10K for 4min, unit stops, or Toil<PS+3K for 10sec, unit stops and alarms; Resume condition: a) when Ta<=0℃, Toil>=Ps+10 and Toil>=6℃, unit starts up; b) when Ta>0℃, Toil>=Ps+10 or Toil>=36℃, unit starts up
37	20	pre-set	
38	20	high pressure sensor Pd too low protection	sensor Pd is below 17.8kg/cm ² for 5 minutes and compression ratio below 2
39	20	low pressure sensor Ps protection	cooling: for 30 seconds, Ps is below 0.505kg/cm ² heating: for 10 minutes, Ps is below -0.505kg/cm ²
40	20	high pressure sensor Pd protection	sensor Pd is over 41.9kg/cm ²
41	20	pre-set	
42	20	pre-set	
43	20	low FQY discharging temp. sensor Td protection	after compressor runs for 10 minutes, Td<Pd+5℃ for 1 minute, unit stops; if within 1 hour, alarm occurs 3 times, unit will alarm.
44	20	communication between main chip 849 and communication chip 849 failure	no communication for 4 minutes
45	20	pre-set	
46	20	communication between connecting board and inverter board failure	after being electrified, communication is abnormal for 4 minutes

Failure code

digit tube indication on master unit	indication on wired controller (hex)	failure code definition	failure description
47	20	radiator failure	radiator temp. over 95 degree when running
48	20	ACCT over current protection	ACCT sensor detects instant current peak value between U and V is over 94A
49	20	ACCT over current virtual value	ACCT sensor detects instant current peak value between U and V is over 34A
50	20	over voltage	VDC is over 817
51	20	current sensor failure	10 seconds later after compressor runs, detecting current among U, V, W is below 1.5A
52	20	radiator sensor failure	before startup, detecting if sensor is connected/disconnected
53	20	current sensor failure	before startup, detecting if sensor voltage is abnormal
54	20	low voltage	detecting VDC is below 289V
55	20	radiator fan failure	in standby state for 10 minutes
56	20	incorrect ACCT	in running, detect H/W of ACCT is wrong
57	20	incorrect DCCT	in running, detect H/W of DCCT is wrong
58	20	incorrect IPM	in running, detect IPM output is wrong
59	20	incorrect VDC	in running, detect H/W of VDC is wrong
60	20	logic problem	in the period of running or startup, detect lock of IPM output is wrong
61	20	IPM in short circuit or its earthing failure	detect IPM is in short circuit or badly earthed
62	20	load in short circuit	detect load is in short circuit
63	20	wrong wiring	detect ACCT is wrong wiring
64	20	over load	detect current is over the limitation for 10 minutes
65	20	DCCT sensor abnormal	in the period of startup, detect DCCT current is below 6.5A
66	20	DCCT sensor broken down	before startup, DCCT voltage is out of control
67	20	communication with fan motor driving board abnormal	no communication for 4 minutes
68	20	IPM of DC fan motor driving board alarm	IPM of DC fan motor driving board alarm
69	20	DC fan motor driving board over voltage protection	DC fan motor driving board over voltage protection
70	20	DC fan motor driving board low voltage protection	DC fan motor driving board low voltage protection
71	20	DC fan motor driving board blocked	DC fan motor driving board blocked, which causes alarm
72	20	EEPROM of DC fan motor driving board failure	EEPROM of DC fan motor driving board failure
73	20	detecting of DC fan motor driving board out of control	detecting of DC fan motor driving board out of control
74	20	DC fan motor driving board over current or current sensor broken down	DC fan motor driving board over current or current sensor broken down
75	20	lack of phase or incorrect phase	lack of phase or incorrect phase
76-79	20	pre-set	

Failure code

(2) Indoor failure code list

failure code on master unit	indication on wired controller	flash times of LED5 on indoor PCB/timer LED on remote receiver	failure code definition
01	01	1	indoor ambient temp. sensor TA failure
02	02	2	indoor coil temp. sensor TC1 failure
03	03	3	indoor pipe temp. sensor TC2 failure
04	04	4	indoor TES sensor failure
05	05	5	indoor EEPROM failure
06	06	6	communication between indoor and outdoor failure
07	07	7	communication between indoor and wired controller failure
08	08	8	indoor drainage failure
09	09	9	indoor repeated address failure
0A	0A	10	indoor repeated central control address failure
outdoor code	outdoor code	20	outdoor corresponding failure

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